

Ebeltoft project: baseline data from a five-year randomized, controlled, prospective health promotion study in a Danish population

TORSTEN LAURITZEN

CHARLOTTE LEBOEUF-YDE

INGA MARIE LUNDE

KAREN-DORTHE BACH NIELSEN

SUMMARY

Background. There is increasing political pressure on the medical profession to approach welfare diseases, such as coronary heart disease and diabetes, through prevention. General practitioners are required to offer regular health checks to healthy people, in spite of the lack of scientific evidence for the universal need, usefulness and side effects of such an intervention. Randomized controlled trials are needed.

Aim. A study was carried out to investigate people's interest in participating in health checks and in discussions about health with their own general practitioner, participants' health status, the proportion who received health advice following health checks, and the lifestyle goals they set following discussion with their general practitioner. This study reports the baseline data from a five-year randomized, controlled, prospective, population-based study in general practices in Ebeltoft, Denmark.

Method. All general practitioners from the four practices in Ebeltoft and a random sample of 2000 people aged between 30 and 50 years were invited to participate. Participants were randomly divided into three groups — one control group and two intervention groups. One intervention group were given a health check which included being screened for cardiovascular risk factors, lung and liver function, fitness, sight and hearing and an optional test for the human immunodeficiency virus (HIV); this group received written feedback from the general practitioner. The other intervention group were also given a health check and written feedback; in addition, they were given the opportunity to attend their general practitioner to discuss preventive health.

Results. A total of 1370 people participated in the study (69% response rate). Health advice was given to 76% of 905 participants following health checks. Almost all of the 456 participants (96%) who were offered the opportunity of discussing their health with their general practitioner took up the offer; 64% of the 456 participants reported that they had decided to undertake lifestyle changes. Eleven of those who discussed their health with the doctor were referred to a specialist (2%).

Conclusion. There was considerable interest in participating in health promotion. Three out of four of those having a health check were given health advice. Two out of three of those offered a health talk with the general practitioner appeared willing to make relevant lifestyle changes. Long-term follow up is needed to determine effects and side effects of health checks and health talks.

Keywords: health promotion; health education; health promotion effectiveness; patients' attitudes; clinical trials in general practice.

Introduction

THERE is increasing political pressure on the medical profession to approach welfare diseases, such as coronary heart disease and diabetes, through prevention. In the United Kingdom, the 1990 contract for general practitioners requires them to offer regular health checks to healthy patients,¹ in spite of the lack of scientific evidence for the universal need and usefulness of such an intervention.^{2,3} The Danish college of general practitioners is organizing the implementation of general practitioner-patient discussions about health combined with minor health checks and wants this to be part of the contract with health authorities.⁴

There is evidence that points to differences in health status between countries, even within the relatively homogeneous western world.⁵ It has been noted that Denmark compares unfavourably with other European and even with other Nordic countries (where standard of living and social and health care services are similar) in terms of morbidity and mortality and of unhealthy lifestyle.⁶ Danes have a reputation for being particularly resistant to health-related change, for which there is some scientific evidence.⁷ It is therefore important to take stock of their present health status and attitudes to lifestyle, and to monitor future trends.

Health checks involve screening healthy people. Stringent criteria must be met to ensure that health checks are suitable for implementation in clinical practice. Randomized controlled trials are essential.⁸ A five-year randomized, controlled, prospective, population-based project is currently underway in Ebeltoft, Denmark, the main aim of which is to test the usefulness of health promotion delivered by general practitioners in health checks and in discussions with patients about health.

The main aim of this part of the study was to describe the baseline health status of participants including: presence of cardiovascular risk factors, lung and liver function, fitness, sight, hearing and (optionally) their human immunodeficiency virus (HIV) status. The study also aimed to report on the extent of health advice given as a result of a health check (and on how many healthy people did not require health advice following a health check) and on health goals that participants set following discussion of their health with their general practitioner. The number of referrals to specialists following the health talks was also examined to determine whether the screening would result in an increase in the number of referrals. The study sample and its representativeness are also described.

T Lauritzen, MD, DMedSc and K-D B Nielsen, MD, general practitioners, the Ebeltoft project, Ebeltoft, Denmark. C Leboeuf-Yde, MPH, senior lecturer, Nordic Institute for Chiropractic and Clinical Biomechanics, Odense, Denmark. I M Lunde, MD, DMedSc, general practitioner, Research Unit, Ringkøbing Amt, Ringkøbing, Denmark.
Submitted: 6 September 1994; accepted: 2 March 1995.

© British Journal of General Practice, 1995, 45, 542-547.

Method

Study setting

Ebeltoft is a coastal town of approximately 13 000 inhabitants, surrounded by a rural district, within the administrative region of Aarhus. The population in Denmark is approximately five million. Data from the Danish central statistical office reveal that the population of Ebeltoft and Denmark as a whole are similar in terms of population increase in 1991, percentage of males in the population, family size, percentage of one-person families in the population and average gross income. Ebeltoft has a somewhat higher proportion of self-employed people and a correspondingly lower proportion of salaried employees than Denmark (9% versus 5% and 21% versus 25%, respectively). The average taxable income is slightly lower in Ebeltoft compared with Denmark as a whole (DKr 104 400 versus DKr 111 100).

General practitioner participants

Nine general practitioners from the four practices in Ebeltoft, covering 87% of the study population, agreed to participate in the study. Because the success of the project depended to a large extent on the cooperation of the general practitioners, they were instructed through a series of meetings on topics such as health-related discussions, dietary advice, and prevention of heart and lung conditions.

Patient sample

All Danish citizens are registered by a personal registration number, based on their date of birth and sex. They are required by law to keep the local population register informed of their present address; because the address is linked to their personal registration number, it is possible to trace virtually everyone who is living in Denmark on a permanent basis. About 90% of all Danish citizens are registered with a general practitioner of their choice within their area of residence (that is, within a radius of 10 km). A list was prepared of all 3467 men and women aged between 30 and 50 years who were living in Ebeltoft and were registered with the study practices (87.2% of the 3978 target population). A random sample of 2000 of these was drawn (according to date of birth) by proportional stratification, so that an equal number of people was represented from each practitioner and age group.

Invitation questionnaire. In September 1991, the 2000 people were sent an invitation from their own general practitioner. It consisted of an explanation of the project and a short invitation questionnaire, containing general questions relating to age, sex, height, weight, occupation and cohabitation status, and questions about attitudes to health, use of tobacco, alcohol and medication, and physical activity at leisure and work.

People were asked to return the invitation questionnaire and to indicate whether they wished to participate in the study and, for those who declined, whether they could be contacted in the future to answer additional questions. Non-respondents, after one reminder, were assumed to be unwilling to participate.

Participants' questionnaire. A large questionnaire was mailed to all those who had indicated that they wished to participate. In addition to the questions which appeared in the invitation questionnaire, it also included questions relating to working conditions, living conditions, health problems, health care behaviour, leisure time activities, quality of life, partner's occupation and important life events. Participants were asked to complete Goldberg's 12-item general health questionnaire.⁹ They were also informed of the availability of an HIV test, which they could have as part of the project or outside the study.

Randomization procedure to control and intervention groups

Those who returned the questionnaire were randomly divided into three groups — one control group and two intervention groups. Division was by proportional, stratified randomization based on general practitioner, sex, age, body mass index and cohabitation status. Couples living together were allocated to the same group to avoid bias between groups.

Participants in one intervention group were given a health check and received written feedback from their general practitioner. Those in the other intervention group were given a health check and written feedback and were given the opportunity to attend their general practitioner to discuss preventive health.

Health checks. Between January and May 1992, the two intervention groups were invited to participate in a health check, designed mainly to detect lifestyle-related conditions. The health check included multiphasic (broad spectrum) screening. Critical values were defined for each test and people were considered to be at risk if the critical value was exceeded for any parameter.

Within two to three weeks of the health check, participants in both intervention groups received personal, written feedback from their general practitioners, whereby test results were explained in easily understood terms. Advice, especially relating to lifestyle changes, was incorporated when values indicated that people were at risk. All participants were also sent leaflets on healthy lifestyle from the Danish Heart Foundation. If signs of disease or indications for further examination were present, the communication also included suggestions about seeking medical care.

Health talks. Participants in the second intervention group received with their written feedback an invitation to make an appointment with their general practitioner to discuss their health in order to receive information and advice on lifestyle changes in particular. Those who accepted had a 45-minute consultation with their general practitioner. A further 15 minutes were allocated for the general practitioner to prepare for and to conclude the consultation. Before this meeting, a short questionnaire was filled in by the participant who suggested suitable discussion topics, in an attempt to facilitate the meeting between the two. This questionnaire was for clinical use only; it was not included in the study material.

At the end of the health talk, participants were invited to set a maximum of three health-related lifestyle goals for the following year. These were confirmed in writing and one copy was given to the participant at the end of the consultation, one was kept by the general practitioner and one was sent to the project administration. It was also possible to book a 30-minute consultation with the general practitioner, to take place three months later.

Five-year study

Follow ups, including questionnaires and health checks, are planned to take place one and five years after the start of the study. Participants in the intervention group receiving a health check and discussing health prevention with their doctor were encouraged to talk with their doctor at least once a year during the five-year study period.

Ethics

Permission to conduct the study was given by the scientific ethics committee of Aarhus and the Danish registry board. It was emphasized to patients that study participation was voluntary and that withdrawal could occur at any time, without negative con-

sequences for the continuing doctor-patient relationship. People randomized into the control group were promised a health check and health talk at the end of the study period, should the study prove that these interventions were of clinically significant value. Questionnaires were coded but returned anonymously, and it was emphasized that participants' replies would be treated anonymously, for statistical purposes only, and that no individual could be identified from the results. An informed-consent form was signed before participation in the physical screening test. It was emphasized that negative tests were no assurance of absence of disease.

Analysis

Data were entered on *Paradox*[®] and later analysed with *SYSTAT*. Double data entry was performed for the initial questionnaire and checked for errors. There were so few errors (fewer than 0.1%) that double data entry was discontinued.

In order to check the validity of responses, information provided in the invitation questionnaire on age, height and weight was compared with the same information obtained by the health check. Agreement between parameters was high (correlation coefficients were greater than 0.9)

Results are mainly presented as descriptive statistics with 95% confidence intervals (CI).¹⁰ Differences between groups were tested with Pearson's chi square test, and differences between means in more than two groups were subjected to analysis of variance, *P* values below 0.01 being considered statistically significant.

Results

Response rate and characteristics of sample

A total of 1370 people (68.5% of the sample of 2000) participated in the study; 465 were in the control group, 449 in the group having a health check only and 456 in the group having a health check and health talk. Their mean age was 40 years, range 30–50 years. Of those participating, 52.3% were women and 47.7% were men. Of the 456 people who were offered a health talk with their general practitioner 95.6% accepted, and 139 (30.5%) took up the offer of a follow-up health talk three months later.

There were fewer men in the final study sample (47.7%) compared with the target population of Ebeltoft (51.3% of 3978) and with the 30–50-year-old population of Denmark (51.2%). The employment status of the study population, the target population and the 30–50 years age group in Denmark is shown in Table 1.

Table 1. Employment status of the study sample, target population and population of 30–50 year-olds in Denmark.

Work group	% of people aged 30–50 years in work group in		
	Study sample (<i>n</i> = 1370)	Target population (<i>n</i> = 3978)	Denmark (<i>n</i> = 1 593 464)
Self-employed/ assisting spouse	16	13	8
Salaried employee	36	40	47
Skilled worker	12	9	9
Unskilled worker	19	17	17
Employed but no further details	0	2	2
Unemployed	7	10	7
Outside workforce	11	9	10

n = number of people in group.

There was a smaller proportion of unemployed people in the sample compared with the target population of Ebeltoft.

A comparison of the three study groups was made on the following risk factors: age, sex, body mass index, smoking, alcohol consumption, leisure time physical activity (heavy and light) and physical activity at work. No statistically significant differences were found.

Health check results

The range of tests undertaken during the health check, and the critical values defined for each test, are shown in Table 2. There was at least one finding outside the predetermined acceptable levels in 76.0% (95%CI 73.2%–78.8%) of the 905 participants who had a health check. The percentages of participants who received health advice for identified risk factors, and the type of health advice received, are shown in Table 3. The most common positive findings were a high percentage of smokers, indicated by raised carbon monoxide levels (36.8% of participants were smokers), low levels of physical endurance (29.7%), poor hearing (18.9%) and raised body mass index or waist: hip ratio (16.1%). It was also noted that 12.6% of participants had decreased liver function and that 11.9% had poor sight despite being tested when they were wearing their correcting lenses. In all, 11.4% of participants were defined as being at high or very high risk of having an acute myocardial infarction, according to the individual myocardial infarction risk score. A total of 217 participants (24.0%, 95%CI 21.2% to 26.8%) had no risk factors identified at the health checks.

Setting of lifestyle goals

A total of 292 of the 456 people (64.0%) offered the opportunity of seeing their general practitioner for a health talk resolved to make one or more lifestyle change. These were most commonly related to increased physical activity, weight reduction or reduced smoking (Table 4).

Referrals following health talks

Eleven of those offered a health check and talk (2.4%) were referred for further medical evaluation following health talks with their general practitioner, most commonly to ear, nose and throat, psychiatry or psychology specialties.

Discussion

The Ebeltoft project is exceptional in that it describes a well-defined population which is largely representative of the Danish population, is prospective in study design, and studies the effect of health checks and health talks under controlled, randomized conditions. The health check focused not only on cardiovascular risk findings but also on issues that are of importance for everyday life, for example alcohol consumption, hearing and vision. Furthermore, written, personalized feedback was provided by the participants' own general practitioners, who also offered personal health talks to one of the study intervention groups. In other studies, contact has been with nurses rather than general practitioners^{13,14} or no formal intervention has been offered.¹⁵

The present study found that there was a general interest in health promotion among the general public, 69% of the invited population completing the initial questionnaires and participating in the study. The general impression was that the questionnaires had been filled in conscientiously by the respondents. The participation rate was comparable with those of British coronary heart disease prevention studies.^{13,14}

Measured by Denmark's current medical standard, the physical health status of the Danish population in this study was

Table 2. Range of tests undertaken in the health check, and the critical values defined for each test.

Test	Critical values
Myocardial infarction risk score ^a	>9
Electrocardiogram	Visual evaluation of ischaemia/severe arrhythmia
Total cholesterol level	>7 mmol l ⁻¹
Diastolic blood pressure, or	>90 mmHg
Systolic blood pressure	>160 mmHg
Lung function	
FEV ₁ and vital capacity	<75% of reference values
FEV ₁ /forced vital capacity	<85% of reference values for non smokers ¹¹
Liver function	
Gamma glutamyl transpeptidase, or	women >50 mmol l ⁻¹ ; men >80 mmol l ⁻¹
Aspartate aminotransferase, or	women >35 mmol l ⁻¹ ; men >40 mmol l ⁻¹
Alanine aminotransferase	women >35 mmol l ⁻¹ ; men >50 mmol l ⁻¹
Creatinine level	women >110 mmol l ⁻¹ ; men >80 mmol l ⁻¹
Non-fasting blood glucose level, or	>7 mmol l ⁻¹
Dipstick urine glucose	Positive
Serum urate level	women >0.35 mmol l ⁻¹ ; men >0.45 mmol l ⁻¹
Urine dipstick	Albumin or blood
Body mass index, or	>30 kg m ²
Body mass index and waist: hip ratio	BMI 25–29 kg m ² plus ratio >1: 0.8
CO concentration in expiratory air	>10 parts per million
Physical endurance	Lowest category of 5 ¹²
Sight (Snellen test) with current correction	<0.6 in 1 or both eyes
Hearing (screening audiometer)	Mean for 500–4000 Hz >20 db in 1 or both ears
HIV status	Positive

^aRisk score jointly recommended by the Danish National Board of Health, the Danish Heart Foundation and the Danish College and Research Foundation of General Practitioners: score of 0–5 is low risk, 6–9 moderate, 10–15 increased and >15 very high risk. It is calculated as a sum score: male sex scores 1; presence of any family members with myocardial infarction when aged <55 years scores 2 each; 1–10 cigarettes per day scores 1, 11–20 scores 3, 21–40 scores 5, >40 scores 7; body mass index ≥ 27.5 kg m² scores 2; systolic blood pressure 140–159 mmHg scores 1, 160–200 mmHg scores 2, >200 mmHg scores 4; diastolic blood pressure 90–109 mmHg scores 1, 110–120 mmHg scores 2, >120 mmHg scores 4; and total cholesterol level 4.5–5.5 mmol l⁻¹ scores 2, 5.6–7.0 mmol l⁻¹ scores 4, 7.1–9.0 mmol l⁻¹ scores 6 and >9.0 mmol l⁻¹ scores 8. FEV₁ = forced expiratory volume in 1 second. CO = carbon monoxide.

Table 3. Proportion of participants in health checks receiving health advice for identified risk factors, and type of health advice received.

Risk factor	Advice given to	% of 905 participants (95% CI) receiving health advice for risk factor
Myocardial infarction risk	Stop smoking, alter diet, increase exercise, lose weight, have abnormal blood pressure treated	11.4 (9.3–13.4)
Electrocardiogram changes	Contact general practitioner	1.0 (0.3–1.6)
Raised cholesterol level	Alter diet primarily	9.7 (7.8–11.7)
Raised blood pressure	Have blood pressure controlled	9.6 (7.7–11.5)
Decreased lung function	Stop smoking (if relevant)	3.9 (2.6–5.1)
Decreased liver function	Consider/decrease alcohol intake	12.6 (10.6–14.8)
Raised creatinine level	Contact general practitioner	1.0 (0.3–1.6)
Raised blood glucose level/ positive urine dipstick test	Contact general practitioner for control of blood glucose as diabetes may be present	2.0 (1.1–2.9)
Raised serum urate level	Alter diet, reduce alcohol intake	3.1 (2.0–4.2)
Positive urine dipstick test for albumin/blood	Contact general practitioner	3.1 (2.0–4.2)
Raised body mass index or waist: hip ratio	Alter diet, increase exercise	16.1 (13.7–18.5)
Raised CO concentration in expiratory air in:		
Non smokers	Contact general practitioner	1.3 (0.6–1.9)
Smokers	Stop smoking	36.8 (33.7–39.9)
Low physical endurance	Increase exercise	29.7 (26.7–32.7)
Poor sight	Consult optician/ophthalmologist	11.9 (9.8–14.0)
Poor hearing	Have ears checked for wax, avoid noise	18.9 (16.3–21.4)
Positive HIV test ^a	Contact general practitioner	0 (0–1.4)

CO = carbon monoxide. ^a382 people (42.2%, 95% CI 38.9% – 45.2%) requested an HIV test.

found to be poor. Eleven per cent of participants were told that they were at a high or very high risk of having a myocardial infarction. The findings indicate that many people had a lifestyle that was characterized by low levels of physical exercise, a fatty

diet, smoking or a high level of alcohol consumption. Other problems concerning the quality of everyday life, such as poor hearing and poor sight, were also common findings.

A comparison of the final study sample with the target popula-

Table 4. Health-related lifestyle goals set by participants in the intervention group offered a health check and health talk with the general practitioner.

Improving lifestyle relating to:	% of 456 participants (95% CI) setting goal*
Physical activity	35.1 (30.7–39.5)
Weight	29.6 (25.4–33.8)
Smoking	20.4 (16.7–24.1)
Diet	18.2 (14.7–21.7)
Work	10.5 (7.7–13.3)
Leisure	7.0 (4.7–9.4)
Alcohol	6.8 (4.5–9.1)
Family	3.9 (2.2–5.7)
Emotional circumstances	3.7 (2.0–5.5)
Medicines	1.5 (0.4–2.7)
Other	7.5 (5.0–9.9)

*Participants could set up to 3 goals, so percentages exceed 100%.

tion and the population of Denmark indicated that there was a smaller proportion of men in the final sample. There were some differences in the workforce distribution, for example 7% of participants in the final sample were unemployed compared with 10% in the target population of Ebeltoft. From other studies it is known that the prevalence of smoking, obesity and alcohol abuse is higher among non-attenders than attenders.^{16,17} From this it is concluded that these risk factors are probably more frequent among non-attending unemployed men than in the rest of the population.

It was encouraging that attenders were interested in changing their lifestyle. Following the health check, 96% of eligible participants attended the preventive health talk with their general practitioner; 64% of the group offered a health talk defined at least one health-related lifestyle goal for the coming year. The three most commonly cited lifestyle goals were to do more exercise, to lose weight and to reduce or stop smoking. These are factors that in a 12-year follow-up study in Oslo, Norway have been shown to be clearly related to reducing myocardial infarction and sudden death.^{18,19} Whether the participants in the present study are able to fulfil their goals, and whether their physical health actually improves, will be investigated in the Ebeltoft project at a later stage.

There has been extensive information in the Danish press on the acquired immune deficiency syndrome (AIDS) and the HIV test. The test is free and can be requested anonymously by anyone in Denmark. About 1% of Danes took up this offer in 1991–92.²⁰ In the present study, participants were informed three months before the health check that they could have an HIV test if they wished; 42% of participants having a health check requested an HIV test. It is not known whether they wished to have the test done because they were in a risk group for HIV or because extensive information on AIDS had created anxiety.

The possible negative effect of health checks (multiphasic screening) requires consideration. A concern with health checks is that an increasing number of people are labelled as having an 'abnormal' test result. In this study, only 24% of participants did not have an investigated risk factor identified. On the other hand, not everybody with a positive test result is ill and will develop disease. Even the concept of risk factors as causes of cardiovascular disease is challenged by some.^{21,22} The larger the number of screening tests, the greater the possibility that healthy people will be incorrectly labelled as unhealthy or at risk.

Present-day concepts that link certain aspects of lifestyle with specific disorders have penetrated into the minds of the general public, and many people whose lifestyles are at odds with prevailing ideas are likely to be left feeling guilty. If health check

programmes disturb participants at risk who cannot undertake the recommended lifestyle changes this would be an unsuitable outcome. It is also undesirable for otherwise healthy people to be left with a feeling of being ill.

General practitioners have expressed ambivalence about risk factor identification and intervention and about the efficacy and practicality of changing people's behaviour towards healthier lifestyles. There have also been concerns that health promotion represents a moral intrusion, and concerns with the manner in which it raises patients' anxiety levels unnecessarily.²³

It is well known that information and knowledge about risk factors and health promotion do not necessarily result in positive lifestyle changes. People tend to underestimate the risk of activities they enjoy, such as smoking and drinking.²⁴ Poor self-perception of health increases the risk of mortality.^{25,26} One must consider the consequences of emphasizing risk factors and unhealthy habits; after all, not all such people will develop disease. Perhaps general practitioners should not seek to identify new patients at risk until we are sure we are providing effective care for those whom we already know about?²⁷

The following conclusions may be drawn from the present study: that there is an interest among the general public in participating in health promotion, that there are health problems among study attenders related to increased risk of morbidity and mortality and to the quality of everyday life, and that attenders are willing to set goals for a more healthy lifestyle.

Health checks and preventive health talks can be of great benefit, but there is perhaps as much potential for doing harm as there is for doing good. Long-term follow-up studies are needed to determine desirable as well as undesirable effects. It is hoped that the ongoing Ebeltoft project will provide the answers.

References

- Chisholm JW. The 1990 contract: its history and its content. *BMJ* 1990; **308**: 853-856.
- Morrell DC. Role of research in development of organisation and structure of general practice. *BMJ* 1991; **302**: 1313-1316.
- Stott N. Screening for cardiovascular risk in general practice. Blanket health promotion is a waste of resources. *BMJ* 1994; **308**: 285-286.
- Nielsen HB. [Health checks and health talks from north of Jutland, an offer for all]. *Ugeskr Laeger* 1994; **156**: 1846.
- Osler M. Smoking in Denmark from 1953 to 1991: a comparative analysis of results from 3 nationwide health surveys among adult Danes in 1953-54, 1986-87 and 1990-91. *Int J Epidemiol* 1992; **21**: 862-871.
- Bjerregaard P, Juel K. [The average lifetime and mortality in Denmark]. *Ugeskr Laeger* 1993; **155**: 4097-4100.
- Olsen J, Frische G, Poulsen AO, Kirchener H. Changing smoking, drinking and eating behaviour among pregnant women in Denmark. *Scand J Soc Med* 1989; **17**: 177-180.
- Holland WW. Screening: reasons to be cautious [editorial]. *BMJ* 1993; **306**: 1222-1223.
- Goldberg D, Williams P. *A user's guide to the general health questionnaire*. Windsor: NFER Nelson, 1988.
- Daniel WW. *Biostatistics: a foundation for analysis in the health sciences*. 3rd edition. New York, NY: John Wiley and sons, 1983: 132-135.
- Dansk lunge medicinsk selskab [A recommendation]. Herlufholmvej 37, 2720 Vanløse, Denmark: Nationalforeningen, 1986.
- Åstrand PO. *Experimental studies of physical working capacity in relation to sex and age*. Copenhagen, Denmark: Munksgård, 1952.
- Muir J, Mant D, Jones L, Yudkin P. Effectiveness of health checks conducted by nurses in primary care: results of the Oxcheck study after one year. *BMJ* 1994; **308**: 308-312.
- Wood DA, Kinmonth AL, Davies GA, et al. Randomised controlled trial evaluating cardiovascular screening and intervention in general practice: principal results of the British family heart study. *BMJ* 1994; **308**: 313-320.
- Holland WW, Creese AL, D'Souza MF, et al. A controlled trial of multiphasic screening in middle-age: results of the south east London screening study. *Int J Epidemiol* 1977; **6**: 357-363.

16. Difford F, Telling JP, Davies KR, *et al.* Continuous opportunistic and systematic screening for hypertension with computer help: analysis of non-responders. *BMJ* 1987; **294**: 1130-1132.
17. Pill R, French J, Harding K, Stott N. Invitation to attend a health check in a general practice setting: comparison of attenders and non-attenders. *J R Coll Gen Pract* 1988; **38**: 53-56.
18. Haheim LL, Holme I, Hjermann I, Leren P. Risk factors of stroke incidence and mortality. A 12-year follow-up of the Oslo study. *Stroke* 1993; **24**: 1484-1489.
19. Haheim LL, Holme I, Hjermann I, Leren P. The predictability of risk factors with respect to incidence and mortality of myocardial infarction and total mortality. A 12-year follow-up of the Oslo study, Norway. *J Intern Med* 1993; **234**: 17-24.
20. Smith E, Melbye M. [First year experience with a system of mandatory reporting of HIV-positive cases in Denmark]. *Ugeskr Laeger* 1992; **154**: 2196-2201.
21. McCormick J, Skrabanek P. Coronary heart disease is not preventable by population interventions. *Lancet* 1988; **2**: 839-841.
22. Oliver MF. Doubts about preventing coronary heart disease. *BMJ* 1992; **304**: 393-394.
23. Williams SJ, Calnan M. Perspectives on prevention: the views of general practitioners. *Social Health Illness* 1994; **16**: 372-393.
24. Royal College of Physicians working party. *Preventive medicine*. London: RCP, 1991.
25. Kaplan GA, Camacho T. Perceived health and mortality: a nine year follow-up of the human population laboratory cohort. *Am J Epidemiol* 1983; **117**: 292-304.
26. Idler EL, Kasl SV, Lemke JH. Self-evaluated health and mortality among the elderly in New Haven, Connecticut and Iowa and Washington counties, Iowa, 1982-1986. *Am J Epidemiol* 1990; **131**: 91-103.
27. Mant D. Prevention. *BMJ* 1994; **344**: 1343-1346.

Acknowledgements

The following general practitioners participated in the project: A Bøgedal, P Grønbaek, L Jørgensen, P T Jørgensen, H Lundberg, J M Nielsen, G S Pedersen, J C Rahbek and N Bie. Extensive administrative assistance was given by E Therkildsen and A Hilligsøe. We thank A Brock, head of the biochemical laboratory, Randers Central Hospital, for analysis of blood and urine. Financial assistance is gratefully acknowledged from: County Health Insurance Office of Aarhus, Health Promotion Council of Aarhus, Ministry of Health foundation for research and development, Health Insurance fund, Lundbeck's Foundation scientific research grant to general practitioners, Danish college of general practitioners (Sara Krabbe scholarship and Lundbeck scholarship), General Practitioners' Education and Development Fund, Swedish Chiropractors' Association, Norwegian Chiropractors' Association, Danish Research Foundation for General Practice, Novo Nordisk Farmaka Danmark A/S (Novo Care research fund), Novo Nordisk Foundation, ASTRA Denmark, Bayer Denmark A/S, Roche Denmark A/S, Farmitalia Carlo Erba/Erbamont Group, Ebeltoft Municipal Council and Danish Diabetes Association.

Address for correspondence

Dr T Lauritzen, Research Unit for General Practice, University of Aarhus, Hoegh-Guldbergs Gade 8, DK-8000 Denmark C, Denmark.

Food for thought...

'The observation that idiopathic parkinsons disease is associated with not smoking cigarettes has been noted since the 1950s. These findings have been shown consistently for both cohort and case-control studies and show a dose-response effect. Current smokers have the lowest risk, with former smokers having an intermediate risk as compared with those who have never smoked.'

Ben-Shlomo Y and Sieradzan K. Idiopathic parkinsons disease: epidemiology, diagnosis and management. *May Journal*, p.261.

ASHFORD HOSPITAL

'BRIDGING THE GAP'

**A collaborative approach to two major change initiatives -
Hospital at Home and Integrated Care Pathways**

**A One-Day Conference to be held on
Thursday, 19th October, 1995 — 9.30 am - 5.00pm**

Cost: £110 inclusive of VAT

**Venue: Education Centre, Ashford Hospital NHS Trust, London
Road, Ashford, Middlesex TW15 3AA.**

This conference will be of value to:

- Managers ● General Practitioners ● Purchasers
- Senior Therapy and Nursing Staff ● Hospital Medical Staff

The topics covered will consider:

- Basic concepts of Hospital at Home and Integrated Care Pathways
- Purchasing perspectives ● Cost implications
- Implications for future policies

PGA Approval obtained

Speakers include:

Professor J Kennerley, Chairman - West Surrey Health Commission
Professor R Jones - Wolfson Professor of General Practice
Mr B Hackman - Consultant Gynaecologist - Peterborough District
General Hospital
Ms A Cooper - Head of Division - Buckinghamshire College
Ms S Johnson - Chairperson - National Pathways Users Group (N.P.U.G.)

**For further information and application forms, please contact: Mrs C
Goodchild, Hospital at Home Scheme, Flat 1, Thelma Golding Health Centre,
92 Bath Road, Hounslow, Middlesex TW3 3EL. Tel. No. 0181 565 2240.**

NORTH THAMES REGIONAL HEALTH AUTHORITY HOSPITALS WITHOUT BEDS?

Innovations in Out-patient and Ambulatory Care

**Monday November 27th 1995
Royal College of Physicians of London
Conference Fee £100**

A one day conference to:

- * review our current understanding of outpatient services
- * explore examples of innovation
- * highlight the implications for the Department of Health, the NHS, the Royal Colleges and Faculties, nurses, patients and carers

Application forms and further details from Ms Vicki Greenway, NTRHA, 40 Eastbourne Terrace, London W2 3QR. Fax: 0171 725 5532

CALL FOR POSTERS

Abstracts up to 400 words describing studies relevant to this conference should be submitted to Ms Vicki Greenway by 23 October 1995. Authors of selected abstracts will be invited to submit a manuscript for the publication of the conference proceedings.

This conference is being held at the Royal College of Physicians by kind permission of the Treasurer.